The Maryland Fruit Grower

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THE ANNUAL MEETING

The forty-first annual meeting of the Maryland State Horticultural Society was held in the Armory at Frederick on January 4 and 5. The exhibits were placed in one end of the Armory, and the meetings were held in the other end, the large floor being divided by a canvas wall. Loud speakers were used to good advantage, but not with entire satisfaction, due to the fact that the meeting room was not entirely sealed off from the exhibit floor. The commercial exhibits were attractive, and several educational exhibits from the University of Maryland, showing Japanese beetle injury and experimental work in apple maturity, spray injury, etc. caused favorable comment. The cup which was won by the University of Maryland fruit judging team in the recent Eastern Intercollegiate tournament was on display. This team was in competition with Ohio State, West Virginia, Rutgers and Pennsylvania State and Tennessee Universities, and great credit goes to the students who won the contest.

President G. William Gardenhour told the growers that there was plenty of work to be done for the industry and the individual fruit growers, and that nobody would do it for us, so we had better get busy and try to do it ourselves. One step seemed to be to form a Legislative Committee in the Society and get acquainted with the political situation as it affects the industry, and then try to help in guiding the legislative program.

R. S. Marsh, Head of West Virginia University Horticultural Department felt that there might be a large crop in sight for 1939, but there was some possibility that the weather might make a difference. He suggested some type of pruning that would reduce the crop of culls, and a "one cut" pruning to remove excess and weak trees; namely, fillers, low-yielders, and trees that are on probation, regardless of soil or variety. A survey in West Virginia showed 236,000 trees should be cut. This would reduce production about 7 per cent. The survey showed that there is great decrease in planting of young trees in West Virginia, while old trees are going out, and also that growers are getting less quality fruit on old trees. Early apples seemed to be losing favor, and canned apples are replacing them to some extent. He advised more stress on cooking quality of apples, in our advertising. Some planting of good trees of proper variety was advised, using best site and soil obtainable.

C. L. Burkholder, Assistant Chief in Horticulture, Purdue University, Indiana, found a stationary spray plant to cost about the same as a portable outfit. Freezing of pipes was prevented by blowing out the pipes with compressed air, and the poor coverage of the tree tops with spray was overcome either by using a portable rig for spraying the tree tops, or better, by getting in under the trees and spraying the tops. He showed some New Jersey figures indicating that during the critical time of codling moth control there was about one-seventh as much arsenic on the leaves as was necessary for good control, and in Indiana, they had found as many scabby apples in the

top third of the tree as on the other two-thirds of the tree. He stressed the importance of thorough and even frequent early spraying for codling moth. Measurements showed at petal fall 5,340 apples per pound. Seven days later, 605 apples weighed a pound, and 9 days after petal fall the apples had sized so that 266 weighed a pound, while 2 days later 220 apples weighed a pound. On July 19th, 10 apples weighed a pound, showing that the fruit grows rapidly, leaving exposed, unsprayed surface for moths to enter. He advised pulling poor trees, no matter how good the soil, as poor roots cannot be "doctored" up. Pruning to thin out the tree tops, thereby destroying the "pest nests" for scab and moth, was advocated. To reduce sunscald danger in the thinned tree tops, he used a mixture of lime and skim milk. Scab was controlled by spraying in the rain, if necessary. This was where the stationary sprayer was valuable. He suggested a heavy spray campaign against first brood moth, and has used an extra "top-off" spray of lead and lime covering only the tops of the trees, just following the calyx spray. He found that in a packing house entirely screened with cheap cloth, 15,579 moths were caught in one day, and over 260,000 moths were trapped in one season. The costs were not excessive, as the cloth was used several times, and egg-laying of these moths was prevented. A permanent sod and straw mulch for trees was the cheapest soil management for Indiana.

M. L. Bobb of Virginia Polytechnic Institute, stated that buckets or pans were too heavy for bait containers for Oriental fruit moth. Quart cans painted various colors seemed to have little attraction for moths, although there was some variation in "catch" of moths in various colored cans, over a period of several years. He concluded that plain tin or aluminum-painted cans were best. Wire screen coverings over the cans had little effect, except for keeping out large moths and insects. The higher on the tree that the cans were hung, the better the catch of moths, but about the tree center was best, as there was less cost in placing the cans, and less spilling of the liquid in high winds. The cans are best placed so that they swing free in the wind, but are not exposed to the sun for evaporation. The best mixture, in general, was: Bentonite, 3 ounces (not absolutely necessary, but serves as an emulsifier). Soak bentonite in some water over night; 14 fluid ounces terpinyl acetate (about 1 cc. per quart of water) and 5 gallons lignum pitch and water to make 100 gallons. About 8 pails per acre were sufficient, placing the pails in trees forming a square about half way from the center and the outer edge of the acre. Actual results were hard to check as the moths were attracted from the check blocks where no bait was placed. However, about 6% reduction in adult moths can be expected. The bait is changed about once a month, and the moth broods begin about the first of May. The cost of material will run about 5 cents per acre.

Note: Maryland growers are using auto quart oil cans and are fitting these with cheap wire bails. G. William Gardenhour, Smithburg, and Dwight Walker, Mt. Airy, report good results from use of these pails.

L. R. Detjen, Horticulturist, University of Delaware, observed that the early dropping of fruits occurred about 10 to 14 days after full bloom, due to underdevelopment or checking of growth of fruits. If freezing weather came after pollination, the fruit dropped in a short time, if injured. There was also some genetic trouble which caused poor pollination in some varieties, and this fruit dropped in the heavy period of fruit drop, probably the middle to the third week in May. There are several different times or periods of fruit dropping, due to several different causes.

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G. S. Langford, Entomologist, University of Maryland reported upon the extensive work done in Maryland in controlling and suppressing the Japanese beetle. A very cheap trap has been developed and a full report of progress in control of this insect menace may be had by writing Dr. Langford, Entomology Department, University of Maryland, College Park, Maryland. Following Dr. Langford's talk, J. K. Funk and J. A. Cohill strongly urged continuation of this work, and the Society passed a resolution to that effect.

Carroll R. Miller, Secretary-Manager of Appalachian Apples, Inc., stated that other fruits are passing the apple in sales due to better merchandising, stating also that citrus growers were spending 3 million dollars annually in advertising. There is plenty to do in apple advertising, but the work is started good, and must go and grow on the growers' own interest and efforts. Nobody will sell our apples for us. We must make the merchants feel that they can make money selling apples, and make the public feel that they need apples, and then we must produce and pack a product that will help sell itself.

W. C. Beaven of Maryland Department of Markets traced the inspection service from its origin as a war measure, and stated that inspection is voluntary and is not a police or regulatory function. Inspectors are impartial and cannot adjust losses. Certificates are valuable where adjustments are necessary, but are of value in showing the grower his faults, and how his fruit reaches market. In Maryland about 2,880 cars are inspected annually. In 1937, 1,013 cars of apples and 88 cars of peaches were inspected in Maryland. Bruising was found to be a serious fault, and better racking of fruit as it is packed, was advised. Barreled apples out of late storage have no "spring" so should be cushioned instead of "plugged." In a discussion following, it was brought out that growers are trying to get too much fruit in packages, making a high bulge and causing bruising. The Eastern Apple Box packed with a bulge was found by one grower to hold about 12% more apples than a packed bushel. Fruit color is a factor to consider seriously. The mixture of soft and hard green peaches in the same basket was condemned.

F. B. Lincoln, Horticulturist, University of Maryland showed some excellent pictures of the hurricane damage to trees in New England where thousands of trees were blown over. Growers had pulled trees back into place and braced them with wire. The roots were placed back into holes and tamped. The results are yet to be seen. There was about 25% loss of trees not considering the trees set back into place. Varieties showed a difference in root strength. Trees that were firm were broken by the wind. Fruit was salvaged from the ground. McIntosh top-worked onto Fall Pippin, Black Twig, Baldwin, Roval Limbertwig, Wolf River and Ben Davis, all fell over. However, when Williams and Baldwin were worked onto McIntosh roots, the trees did not blow over. There seemed to be a definite effect of the top-worked variety on the root system in manner of growth. Roughly, King, Astrachan, Transparent and Gravenstein were less root-firm than McIntosh; and Ben Davis, Baldwin and Delicious were more root-firm than McIntosh. Varieties which did not blow down were Rhode Island Greening, Sutton, Fameuse, Duchess, Wealthy, Williams, Golden Delicious, Fall Pippin, Steele's Red, Pound Sweet, and Spy.

R. B. Gray, of the U. S. Bureau of Agricultural Engineering reported that rubber-tired farm and orchard machinery was on the increase, especially on sprayers. He gave some excellent mechanical hints on rubber-tired equip-

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ment. In a discussion following, it was brought out that growers actually had less erosion where machinery was on tires, as the ground was not torn up to cause washing. Mr. Waddell of New Windsor Orchards advised the use of good, large tires, and reported less gas consumption, more work, more comfort for the operator and longer life to machinery where tires were used. He formerly wore out a set of steel cleats a year on tractors, and since rubber tires were installed, these tractors have had three years of service out of a set of tires, and the tires are scarcely worn.

W. J. Welday, an Ohio fruit grower, stated that any business depending upon cash, will reach a saturation point. Our point has been over-production. We went into the depression over-producing, and even now, our markets seem glutted and limited. We must advertise and keep our culls at home, as the Western growers are doing. We must stress flavor and goodness of apples, and not health qualities alone. We need some practical research on human nature and on standardization, and must guide advertising accordingly. We depend upon people's love of apples and send them junk. Standardization will come when the growers want it. We must be interested in how our fruit gets to the consumer. Smaller packages may keep fruit in better shape for the consumer. Some growers store fruit and allow consumer to take it in small amounts. Research must consider all angles of the apple, so people will know the true values of it. Culls must be eliminated just as wheat is plowed under. Foreign markets and by-products must be developed. As individuals, fruit growers will develop self-reliance and efficiency when they come to a low ebb. No matter how poor a business may become, somebody will make money at it. We must analyze ourselves, and our methods and our business, if we hope to make any progress. Our orchards must be research centers, and we must try new things. If adversity has taught us anything, it was worth all the sorrow. There is plenty of competition ahead, and the fruit growing industry needs less snoring and more hollering.

L. A. Stearns, Entomologist, University of Delaware reported that spray injury was still a new problem, and becoming more serious. We are still looking for a low-cost, non-caustic, and toxic spray material. Much of our injury has come from use of substitutes to dodge spray residue, and ideal mixtures or separate materials have not been fully developed. Also, weather and incompatible mixtures that did not like each other, had teamed up to do injury. In general, the fungicide or disease spray program should begin with lime-sulfur, then work into lime-sulfur and wettable sulfur mixtures, then go into weak Bordeaux for the summer. The grower cannot simply follow any spray calendar, but must adapt the spray calendar to his conditions.

H. S. McConnell, Entomologist, University of Maryland reported that after 3 years of trials of spray materials, there were many unanswered problems. In general, the red varieties in his trials had had less injury when sprayed early with wettable sulfur, lead arsenate and lime, then weak Bordeaux, soap and arsenate of lead, while the yellow varieties had less burn when sprayed with wettable sulfur lead and lime throughout the season. However, this will not hold true season after season. Wettable sulfur does not control scab and may add to scald danger, especially in hot weather, and in the early season when the foliage is tender. He also discussed ethylene dichloride as a peach borer control. It has virtue over para-di-chloro-benzine treatment as it can be applied later with good results.

C. Graham, Entomologist, University of Maryland divided growers into three classes in codling moth control: first, those having modern sprayers and

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washers and who spray the inside of the trees; second, those having fairly good equipment, and do an average, but not thorough job of spraying; and third, those with poor machinery, and who spray poorly. He advised tree banding in heavily-infested orchards and sanitation around packing houses, as moths spread farther each year from the packing house, no matter how we spray the orchard. He stated that red mite eggs are now in the orchard, and it is uncertain how serious aphis may become. For scales and aphis, either oil-dinitro spray or tar oil spray were recommended as a dormant application.

The Society passed resolutions denouncing the Patman Bill, which would tax chain stores heavily; asking our Congressmen to have agricultural labor exempted from the Wage Hour Law; conferring Honorary life membership on Mr. E. P. Cohill and Mr. A. L. Towson; asking for State funds for continuing Japanese beetle work, also for combating bee diseases which would have an effect upon orchard pollination, and also asking funds for research work in strawberry diseases and insects which are proving serious to Maryland's strawberry industry; thanking the Secretary of Agriculture for his action in reducing spray residue tolerance, and requesting further work with residue as it affects public health; thanking those responsible for the success of the meetings; recommending that the discussions during the meetings be taken by a stenographer, for inclusion in the Proceedings; recommending that the 1940 meetings be held in Hagerstown.

Have you read the advertisements?

THAT WEST VIRGINIA MEETING

The West Virginia Horticultural Society will meet at the Market House, Martinsburg, on February 1 and 2. Their meetings are always good, with fine speakers, lively topics, and real discussions. The growers of West Virginia have asked that a cordial invitation be extended to all Maryland growers to attend these mettings.

Remember our advertisers

COLD STORAGE HOLDINGS

The Bureau of Agricultural Economics, U. S. Department of Agriculture reports cold storage holdings of January 1 as follows:

	5-Yr. Av. 1933-37.	Jan. 1, '38.	Dec. 1, '38.	Jan. 1, '39.
Apples, barrels	726,000	411,000	320,000	222,000
Western boxes	13,486,000	13,952,000	14,804,000	13,134,000
Bushels *	9,342,000	16,819,000	15,051,000	12,448,000
Total bushels	25,006,000	32,004,000	30,815,000	26,248,000

* Includes baskets and Eastern boxes or crates.

THE APPLE SHOW

The Second Annual Apple Show, held at Lord Baltimore Hotel, Baltimore, on January 11 and 12 was larger than last year, and the quality was very good. Lloyd Balderston, Colora, Cecil County won the most points. Fruit was exhibited from Cecil, Baltimore, Frederick and Carroll counties. Full report will be published in the February Maryland Fruit Grower. The Show won plenty of fine comment, and was really a beautiful set-up.

Diner—Are these rolls fresh?

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PRUNING

The pruning season has been on for quite a few weeks, and it may be a little late to discuss this rather important orchard practice. However, a few remarks for consideration may not be out of place.

During a recent meeting of horticultural extension workers from several States, ranging from New England, Maryland, West Virginia and as far west as Indiana, the point was made that we may be facing another heavy crop year. Also that due to forced economy measures, many growers have reduced pruning to a bare necessity or have abandoned it altogether. Also, some growers have made it a practice to prune each tree every other year. In any case, the discussion resolved itself into just what would be the advice to the fruit grower regarding pruning, in the face of the heavy crop, if the heavy bud set turns out as it now appears. If we do have a heavy crop, do we want a lot of lower grade apples, or should we prune to thin the crop and hope to get more better grade fruit, and also hope that the heavier pruning will stimulate buds for the 1940 crop? It may be dangerous or foolish to try to make a flat recommendation to all growers, so that the suggestions must be taken and analyzed by each grower to fit his individual case. In the end, the question of how much pruning can be done will depend upon the growers' budget. How best to spend that money is the thing to really consider. In other words, will it be better to take out a few larger branches per tree, or would it be better to take out several smaller branches, or should we make the usual small cuts, and many of them, per tree? The concensus of opinion at the meeting was that it would be well for the apple grower to prune as much as he can afford, tending toward cutting down total production, but increasing size and color, and then to thin just as much as necessary, and as early as possible to take off the cull and lower grade stuff, and thus stimulate fruit buds for the next year and also to help as much as possible toward bringing trees toward annual crops. This applies especially to the better varieties. There are some "catches" in these recommendations, for weather may come in and reduce the crop. Frost may kill or weaken the blossoms or buds. Dry weather may cause even heavy bearing trees to repeat a heavy crop. That has happened in some varieties during the past few years. Then there are some growers who prefer some low-grade fruit to a reduced crop, as there is some outlet to canneries and cider mills for such fruit, and some revenue coming from it. There are lots of other arguments and considerations too lengthy to be considered here. Consequently, the above information is passed to the growers for their own consideration.

Pruning is a much cussed and discussed orchard operation. It is expensive. It has been given credit or discredit for many things. It can dwarf trees, if done to excess. However, there is a necessary and definite place for it. In a recent issue of "Hoosier Horticulture," Monroe McCown, Extension Horticulturist writes as follows:

"Following a light crop, the average apple tree in Indiana orchards now shows promise of a good crop of fruit in 1939. Although that crop may not materialize, the average apple grower, being ever an optimist, expects to harvest that crop next fall. Buoyed up by "a pocket full of optimism" he will attempt to stretch his limited capital by carefully budgeting his orchard operations. Economy will be the watchword.

The "brush wall" (composed of a mat of thick branches in the lower

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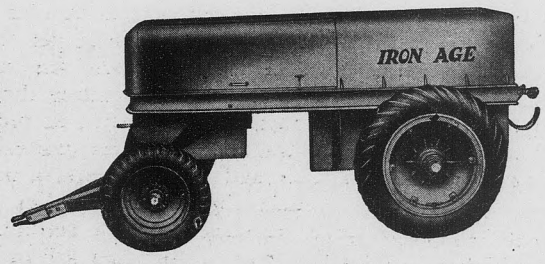

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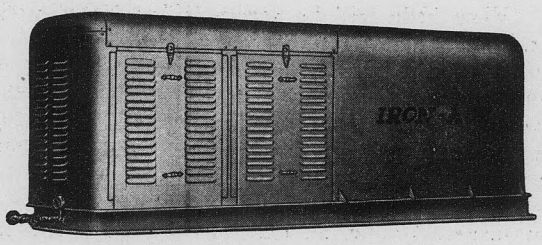

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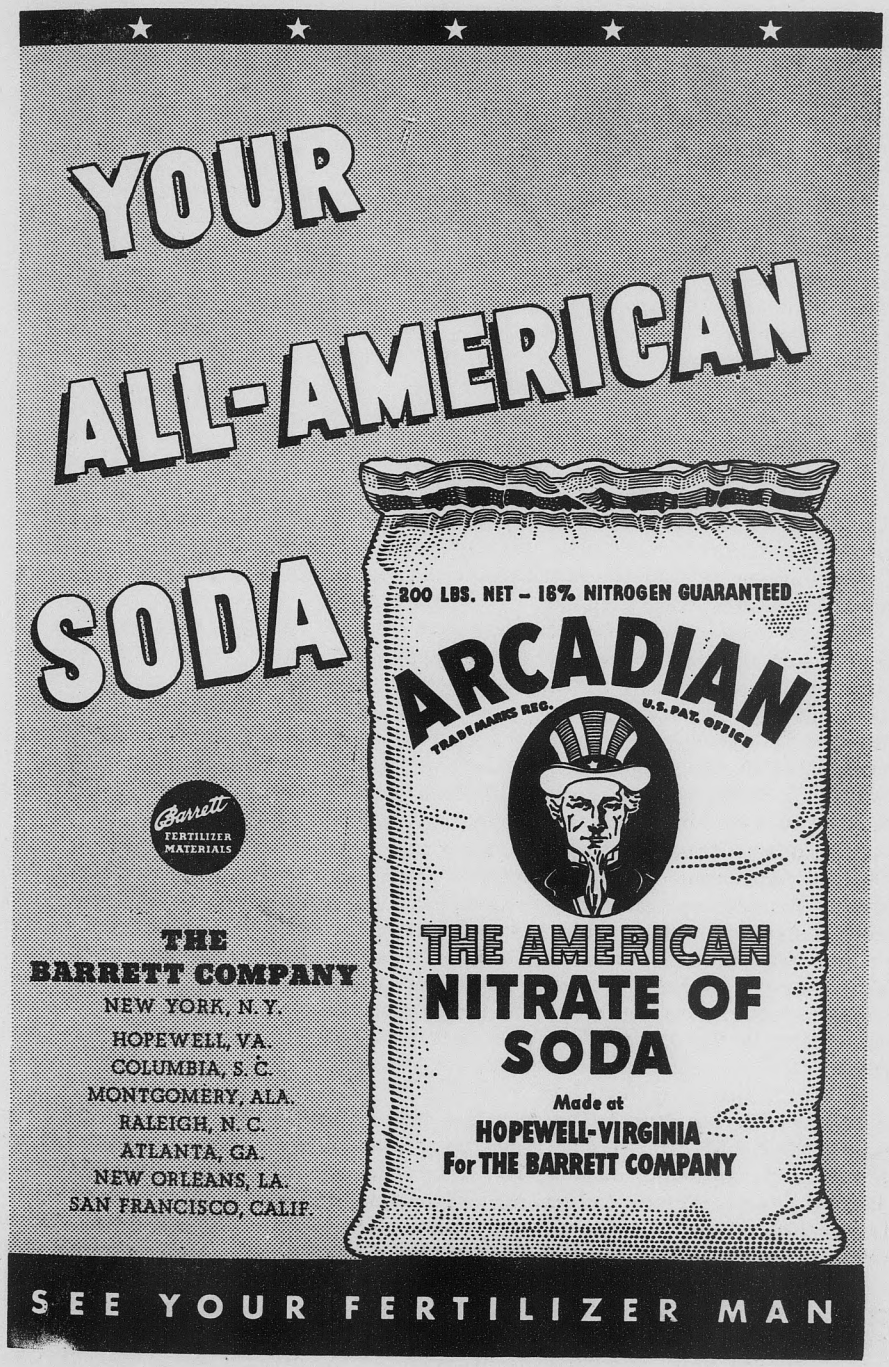
part of the tree) may handicap the grower seriously unless considered in the organization and execution of the program of economy. Such a wall is evident first in the lower portion of the young bearing tree when it reaches an age of 12 to 16 years.

This "brush wall" prevents proper distribution of light through portions of the tree, interfering with leaf development which reduces the formation of fruit buds in the shaded areas and prevents proper sizing and coloring of the limited number of fruits produced on this weakened wood. In spraying such brushy areas, the grower applies extra heavy dosages in an effort to penetrate this barrier, increasing the amount of spray material used, and frequently, causing serious injury to foliage and fruit in the oversprayed areas. This extra effort and the use of added material frequently fails to prevent rather serious injury by diseases and insects.

The "brush wall" begins to develop in the lower portion of the younger bearing tree following the production of the first heavy crop of fruit. The weight of the fruit drops the outer and lower branches from an upright position in the tree. As these branches are pulled down by the crop, one piles onto the one below it and in the course of a very few seasons the entire lower third of the tree may be composed of a mat of branches. Without correction by annual pruning, the brush wall progresses upward as the seasons pass and the older bearing tree soon reaches the stage of so-called "shell production," the fruit being limited to shell of the tree since the center portions are too heavily shaded.

In pruning the younger bearing tree, the pruning should be limited largely to the lower third of the tree. Because of the fact that the growth in the upper two-thirds of the tree is well distributed, light conditions are favorable to the production of vigorous fruiting wood. Only a very few cuts will be needed in this upper area. These cuts should be limited to the removal of vigorous branches growing toward the center which prevent the main scaffold branches from being pulled further from their upright position. Such cuts will spread the tree. As time passes, however, and the "brush wall" tends to progress up the tree, pruning will be needed to correct this condition higher in the tree. This work can be done very rapidly by the use of the saw and loppers. Very little will be accomplished if an attempt is made to correct this condition by the removal of a large number of the smaller growths. A majority of the branches removed will range from one-half inch to one and one-half inches in diameter at the base. Varietal requirements will vary greatly. Golden Delicious, Rome, and several other of our better commercial varieties normally produce a great excess of these secondary branches which must be thinned rather regularly to prevent the continuance of the "brush wall".

If weather conditions are favorable, an excessive load of fruit may be set by the average bearing tree in 1939. In this case, hand thinning of the fruit will be practiced in an effort to increase size and color of fruit, and possibly to promote annual bearing of certain varieties. The efficiency of the fruit thinning program is frequently very low, however, if the trees are quite thick with brush. A very thorough pruning given the thick bearing tree previous to the heavy bearing year should aid materially in improving the general vigor and thus increase the value of the fruit thinning. The more vigorous growth resulting from the stimulation provided by the pruning seems to contribute much to fruit size and vigor of the new spur growth. While there is little data to support the contention that thorough pruning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promoes annual bearing, the observations of the effect in commercial plantings tend to show a decided effect. As one steps up the vigor of the average bearing tree, one would expect to provide conditions more favorable to the formation of flower buds.

If the grower can finish the pruning job between mid-February and the time growth begins, he should wait until that time to begin pruning. The grower who has a large acreage to cover, however, usually finds it necessary to begin earlier in the winter. In this case, the older trees should be pruned first and the younger trees left until late February or later. The paint bucket should accompany the pruners, cuts being painted the same day they are made. Many good wound dressings are available and excellent dressings may be prepared at home either by thinning coal tar with creosote or mixing bordeaux powder and raw linseed oil. The resulting mixture should be thick enough to stick well on the surface of the cut and not run after it is applied."

Over in Ohio, some investigators went deeply into the pruning question. In a report printed in The Bimonthly Bulletin, Vol. 23, No. 193, July-August, 1938, issued by Ohio Agricultural Experiment Station, Wooster, C. W. Ellenwood, and J. H. Gourley stated that they had selected some Baldwin and Stayman trees planted in 1916, some of which had never been pruned, some pruned lightly, and others pruned heavily. The lightly pruned trees had had a light thinning out, and sufficient restriction of terminal growth to preserve fair symmetry of the trees. The heavily pruned trees had about the same treatment as the lightly pruned trees, excepting that in their early years the trees had been cut heavily, leaving less smaller lateral fruiting branches. Records on the Baldwin trees were taken from 4 full crop years, or 1931, '33, '35 and '37. The Stayman records were taken in 1930, '32, '34 and '36. The lightly pruned and heavily pruned Baldwin trees showed 92.5 and 93.5 per cent respectively of fruit over 2¾ inches and the unpruned trees averaged 81.7 per cent fruit above 2¾ inches. The unpruned trees had 65% fruit over 33% color, while the lightly and heavily pruned trees showed 81.8 and 87.9% respectively.

Now let's forget the Baldwin trees and consider only the Stayman trees. The Stayman trees showed about 17% more fruit above 2¾ inches on the heavily pruned trees and 14% more above 2¾ inches on the lightly pruned trees than on the unpruned trees. The average annual yield on the heavily pruned Stayman trees was about 200 pounds less than on the unpruned trees. There was an average of about 3 feet less spread of tree, 2½ feet less height, and 3 inches less circumference of trunk per tree on the heavily pruned Stayman trees, at the age of 22 years, than on the lightly pruned and unpruned trees.

The influence on value of fruit per tree for the 4 crop years was computed considering No. 1 Stayman at 1½c per pound, No. 2 grade at 1c per pound, and culls at ½c per pound, and the value of 100 pounds of fruit (Stayman) was: unpruned, $1.16; light pruned, $1.29; heavy pruned, $1.33. The grades average as follows: No. 1—Unpruned 46%; light pruned 65%; heavy pruned 69%. No. 2—Unpruned 40%; light pruned 28%; heavy pruned, 27%. Culls—Unpruned 14%; light pruned, 7%; heavy pruned 4%.

The total weights of Stayman fruit were: top, 1,031 pounds; lower, 970 pounds; inside, 499 pounds. The comparative values of the fruit per 100 pounds were: top $1.14; lower, $1.08; inside 85c.

Here are some of the comments made in the article:

"There is little to indicate that pruning had any appreciable effect on

the average annual production for the 8-year period when both heavy and light crop years are included. The average yield per tree of the Stayman on the light pruned plot during the light crop years exceeded that from the unpruned plot by 27 pounds. This is a comparatively small difference, but would tend to increase slightly the value of the fruit per tree of the light pruned as compared with the unpruned Stayman over the 8-year period.

Minor Advantages on Pruning

Some of the minor advantages to be expected from at least light pruning not measured here are:

1. Picking is facilitated.
2. The spray material required, theoretically at least, is somewhat greater on the unpruned trees, although actually there would be a comparatively insignificant difference in cost.
3. More thorough spraying is possible on pruned than on unpruned trees.

Conclusions

A careful study of the data presented here shows that heavy pruning resulted in a serious loss in the value of fruit as compared with no pruning. Even light pruning of Baldwin actually reduced the value of the fruit per tree. Moreover, the margin of profit as the result of light pruning in the case of Stayman was no narrow as to made it insignificant.

Varieties respond differently to similar pruning treatments. The data here presented are rather limited both as to varieties and pruning treatments. *It is not suggested that the orchardist follow a policy of no pruning.*

Pruning generally represents from 8 to 10 per cent of the total growing costs of apples from mature trees, and if the process of pruning also reduces yield an appreciable amount, growers are warranted in scrutinizing this operation very carefully. Conventional pruning recommendations frequently have been made with little regard for the net results from an economic standpoint.

The comparatively low grade of fruit, both as to color and size, on the inside of the tree, particularly of Stayman, suggests that much of the weak growth in the center of these unprunes trees might have been eliminated without much actual loss. The elimination of a few of the unproductive limbs on the inside section of the trees would have facilitated picking to a considerable degree."

But after all of this is read over, and considered, we find the following in the late issue of "Tennessee Horticulture":

"Cull apples are the underprivileged fruits. They are undernourished and have grown in crowded, dark places where sanitary measures don't reach them, but insects and diseases do.

Clean up these apple slums with pruning shears and saw. Some trees, due to age, poor feeding, disease or injury, can produce only cull apples, and should be given axe treatment. Others need major repairs. Look above each sound scaffold limb for a secondary limb which may be almost as long but slender and with few good lateral branches close to the trunk, and similar limbs between the scaffolds. Don't head back such limbs—remove them. Each sound, well-placed main limb should be an entity, with enough space above, below and on each side for light, air, and spray materials to reach it freely. Some trees need only a good housecleaning—cutting out poor, weak-growing laterals especially those which grow downward from main limbs, and others which may be crowded in the top or inner part of tree."

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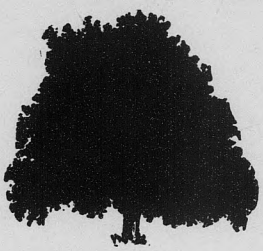

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